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EXAMINER

MILLER, MARINA I

ART UNIT PAPER NUMBER

1631

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/800,340

Applicant(s)

WENG, LEE

Examiner

Marina Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 60-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-59 and 66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-66 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/28/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Applicant's election with traverse of Group I (claims 1-59 and 66) in the reply filed on 9/28/2006 is acknowledged.

The traversal is on the ground(s) that the subject matter of claims 1-59 and 66 AND 60-65 is sufficiently related, the claims are classified in the same classes/subclasses and a search and examination of the entire application would not place a serious burden on the examiner. This is not found persuasive because the inventions of Groups I and II are distinct. Each of the methods has different goals and steps and none of the methods is required for any of the other methods. The examiner must search non-patent literature and foreign patents as well as U.S. patents and publications for any single group, and therefore maintains that a search for more than one group would be burdensome. In addition, the search required for each group is not coextensive with that required for any other group, therefore the examiner maintains that a search for more than one group and species would be burdensome.

The requirement is still deemed proper and is therefore made FINAL.

Claims 60-65 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim.

An action on the merits of claims 1-59 and 66 follows.

Information Disclosure Statement

The Information Disclosure Statement (IDS) filed 9/28/2006 has been considered in full.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-57 and 66 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 recites a method for correcting errors in a pair of profiles comprising calculating an average reference profile, determining a differential reference profile, and generating an error-adjusted experiment profile. All dependent claims only comprise mathematical formulas and/or mathematical manipulation. Claim 66 recites a method similar to that of claim 1. However, not all processes are statutory under 35 U.S.C. 101. *See* MPEP 2106 (Section IV in particular). To satisfy 101 requirements, the claim must be for a practical application, which can be met if the claimed invention “transforms” an article or physical object to a different state or thing OR the claimed invention otherwise produces a useful, concrete, and tangible result. If claims are directed to abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature, the claims must be considered as a whole for determining whether an abstract ideas, natural phenomena, or laws of nature has a particular application.

In the instant case, the claimed method does not transform or reduce an article or a physical object (*e.g.*, signals produced by labels) to a different stage or thing because the “result” of the method (*i.e.*, an adjusted profile) is merely data (*e.g.*, measurements) and is not equivalent to physical transformation. The claims do not recite tangible expression (*i.e.*, real-world result) of generating an adjusted profile in a form useful to one skilled in the art. Thus, the method does not recite steps of producing something that is concrete, useful, and tangible, and is not statutory.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-59 and 66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 30, and 66 recite in the preamble “correcting errors in ... pairs of profiles.” The claim steps recite only generating an error-adjusted experimental profile A_m' . It is not clear whether an error is intended to be corrected in an experimental profile using a reference profile for each pair $A_m C_m$ OR some error generated by each pair $A_m C_m$ is intended to be corrected for all pairs. It is also unclear whether the limitation “thereby correcting” is intended to be an active, positive method step or merely an intended result of the method. Therefore, the relationship of the preamble and the method steps is also unclear because the preamble recites “[a] method for *correcting* ... pairs of profiles” and the method only recites steps of calculating, determining, and generating an error-adjusted experiment profile. As the intended limitation is not clear, claims 1-59 and 66 are indefinite.

Claims 1, 30, and 66 recite determining a differential reference profile of C_m and average profile C. It is not clear whether a differential profile is determined for C_m and average C separately, for a combined profile (C_m and average C), or the differential profile is based on C_m and average C (e.g., similar to the profile recited in claim 4). As the intended limitation is not clear, claims 1-59 and 66 are indefinite.

Claims 1, 30, and 66 recite “generating ... error-adjusted experimental profile ... by a method comprising adjusting ... profile using ... the differential reference profile ... thereby correcting errors in ... pairs of profiles.” It is not clear whether applicants intended to limit the method steps OR the data by reciting a method by which data (adjusted profiles) are generated. If the latter, then it is not clear what further limitation of data used in the claimed method is intended by the methods of producing the data. If the former, then the claims should be rewritten so that it is clear that “adjusting” and/or “using” are active, positive method steps. As the intended limitation is not clear, claims 1-59 and 66 are indefinite.

Claims 1, 30, and 66 recite the limitation “constituents ... measured in a sample having subjected to condition A_m and ... condition C.” However, earlier the claims recite that A_m and C stand for an experimental profile and a reference profile, respectively, not for “conditions.” As the intended limitation is not clear, claims 1-59 and 66 are indefinite.

Claims 1 and 66 recite a data set $\{A_m(k)\}$ comprising measurements of a plurality of different cellular constituents measured in a sample, wherein $k=1 \dots N$, and N is an index of measurements of cellular constituents. It is not clear whether “k” stands for k-th constituent (e.g., gene 5) OR for a number of repetitions of measuring cellular constituents (e.g., expression of genes 1-100 is measured “k” times for better statistics). As the intended limitation is not clear, claims 1-59 and 66 are indefinite.

Claims 3 and 43 recite the limitation “wherein experimental profile and reference profile are measured in the same experimental reaction.” It is not clear whether “measuring” is intended to limit the method or data. If the latter, then it is not clear what further limitation of data used in the claimed method is intended by the methods of measuring the data. If the former, then the

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claims should be rewritten using active, positive claim language. As the intended limitation is not clear, claims 3-14, 18-29, and 43-59 are indefinite.

Claims 15 and 55 recite the limitation “wherein ... profiles ... [are] measured in a two-channel microarray experiments.” It is not clear whether applicants intended to limit the method steps OR the data by reciting a method by which data (profiles) are measured. If the latter, then it is not clear what further limitation of data used in the claimed method is intended by the methods of measuring the data. If the former, then the claims should be rewritten using active, positive claim language. As the intended limitation is not clear, claims 15-16 and 55-59 are indefinite.

Claim 16 recites the limitation “wherein said reference profiles ... are measured with samples labeled with a same label.” It is not clear whether a reference profile is measured in a labeled sample, both a reference and an experimental profile are measured in two samples that are labeled with the same label, different reference profiles are measured in different samples labeled with the same label, *etc.* As the intended limitation is not clear, claims 16 and 56-59 are indefinite.

Claim 18 recites “transformed profiles comprising transformed measurements.” It is not clear what “transformation” of profiles is intended and neither the specification nor the claims defines the transformation. As the intended limitation is not clear, claims 18 and 58-59 are indefinite.

Claim 19 recites the limitation “wherein said transformed measurements are obtained according to equations.” It is not clear whether “measurements” are obtained using the recited equations or earlier obtained measurements are transformed by applying the recited equations. As the intended limitation is not clear, claims 19 and 58-59 are indefinite.

Claim 19 recites the limitation “transformed measurements ... $A_m(k)$ ” and “an experimental profile XA_m and ... measured data set $\{XA_m(k)\}$ ”. Claim 19 depends from claim 1 which recites $A_m(k)$ being a data set of an experimental profile, not transformed measurements. Claim 1 also recites that A_m stands for an experimental profile, not XA_m , and $\{A_m(k)\}$ stands for a data set of the experimental profile, not $\{XA_m(k)\}$. Therefore, it is not clear what experimental profiles and data sets are intended in claim 19. As the intended limitation is not clear, claims 19 and 58-59 are indefinite.

Claims 20-21 and 38-39 recite the limitation “measurements from which nonlinearity is removed.” It is not clear what limitation is intended because the limitation “nonlinearity” which is removed from “measurement” is not clear, and neither the specification nor the claims define the limitation. As the intended limitation is not clear, claims 20-24 and 38-59 are indefinite.

Claim 21 recites the limitation “wherein said measurements from which nonlinearity is removed are obtained by a method comprising [steps] (i) ... and (ii).” Claim 21 depends from claim 1. It is not clear whether steps (i) and (ii) are intended to be active, positive method steps of the method recited in claim 1 or merely an intended use/result of the method. If the former, then it is not clear where steps (i) and (ii) fit within the method of claim 1, *i.e.*, whether steps (i)-(ii) are additional steps or they are intended to substitute steps recited in claim 1. As the intended limitation is not clear, claims 21-24 and 58-59 are indefinite.

Claim 21 recites determining an average profile of all experiment A_m and reference profiles C_m . It is not clear whether two average profiles are determined separately for all A_m or/and all C_m OR one average profile is determined for all A_m and all C_m . As the intended limitation is not clear, claims 21-24 and 58-59 are indefinite.

Claim 21 recites the limitation “adjusting each A_m or C_m based on a difference between said A_m or C_m and said average profile.” The antecedent basis of the limitation “said average profile” is not clear because step (i) recites both experimental and reference average profiles. Criteria, steps, or algorithms of “adjusting” are also unclear. As the intended limitation is not clear, claims 21-24 and 58-59 are indefinite.

Claim 22 recites the limitation “wherein said difference is determined using a subset of measurements in the profiles.” The antecedent basis of the limitation “the profiles” is not clear because claim 21, from which claim 22 depends, recites different types of profiles. It is also not clear whether “determining” is intended to be an active, positive method step or merely an intended use of the method. As the intended limitation is not clear, claims 22-24 and 58-59 are indefinite.

Claim 23 recites the limitation “wherein said subset of measurements in the profiles consists of measurements that are ranked similarly between an experiment or reference profiles and said average profile.” It is not clear whether the limitation “the profiles” is intended to comprise an average profile, only A_m or C_m , both A_m and C_m , *etc.* It is not clear what is ranked, *e.g.*, experimental measurements, reference measurements, average measurements, *etc.*, and between what ranked measurements the similarity is assessed. It is also unclear whether measurements are ranked, for example, in each profile, OR measurements are ranked between the value of measurements in a reference profile (*e.g.*, maximum measurement is 10) and the value of measurements in an average profile (*e.g.*, minimum measurement is 5) (*i.e.*, experimental measurements are ranked between 5 and 10). As the intended limitation is not clear, claims 23-24 and 58-59 are indefinite.

Claim 24 recites the limitation “claim 23, wherein said comparing in step (ii) is carried out by a method comprising [steps] (ii1) binning measurements ... and (ii4).” The limitation “said comparing” does not have an antecedent basis because claim 23 does not recite a step of “comparing.” It is further unclear whether each bin comprises only A or C measurements OR both A and C.

Claim 24 depends indirectly from claim 1. It is unclear whether steps (ii1)-(ii4) recited in claim 24 are intended to be active, positive steps of the method recited in claim 1 or merely an intended use of the method. If the former, then it is not clear where the steps fit within the steps recited in claim 1 and whether the steps (ii1)-(ii4) are intended to be added to or substitute for steps of claim 1.

As the intended limitation is not clear, claims 24 and 58-59 are indefinite.

Claim 26 recites the limitation “wherein normalized profile ... is obtained by a method comprising normalizing ... according to equation.” Claim 26 depends from claims 1-14 and 25. It is not clear whether “obtaining a normalized profile” is intended to be an active positive method step of the method recited in the claims 1-14 and 25 or merely an intended use of the method and where the step of normalizing fits within the method recited in claims 1-14, 25, As the intended limitation is not clear, claims 24 and 58-59 are indefinite.

Claim 30 recites a step of “processing profiles.” It is not clear what specific steps, algorithms, or methods of “processing” are intended. As the intended limitation is not clear, claims 30-59 are indefinite.

Claim 30 recites an experimental profile XA_m in the preamble and after step (c) and a processed profile A_m in step (a). However, in step (d) the claim recites “said experimental profile A_m .” It is not clear whether XA_m or A_m is intended to be an experimental profile and what profile is used in step (d) for generating an error-adjusted experimental profile A_m' .

Claim 30 also recites XC_m being a reference profile and C_m being a processed reference profile in the preamble, and in step (a). Claim 30 further recites that C_m stands for a reference profile in step (b). Thus, it is not clear whether XC_m or C_m is intended to be a reference profile. Therefore, the relationship of an experiment profile XC_m , a processed profile A_m , a reference profile XC_m , and a reference processed profile C_m is not clear.

As the intended limitation is not clear, claims 30-59 are indefinite.

Claim 30 recites in step (a) “to obtain a plurality of ... processed profiles.” It is not clear whether “obtaining” is intended to be an active, positive step of the method or merely an intended result. As the intended limitation is not clear, claims 30-59 are indefinite.

Claim 36 recites the limitation “transforming normalized profiles to obtain transformed profiles.” It is not clear what particular steps or algorithms of “transformation” are intended and to what (*e.g.*, profiles, different data set, graphs, *etc.*) profiles are transformed. As the intended limitation is not clear, claims 36-59 are indefinite.

Claim 37 recite the limitation $TA_m(k)$ and $TC_m(k)$. However, neither the claims nor the specification defines the limitations. As the intended limitation is not clear, claims 37-59 are indefinite.

Claim 39 recites the limitation “wherein removing ... is carried out by a method comprising [steps] (a1) and (a2).” It is not clear whether applicants intended to limit the method steps OR the data. If the latter, then it is not clear what further limitation of data used in the claimed method is intended by the methods of obtaining the data. If the former, then the claims should be rewritten to clearly delineate the method steps. As the intended limitation is not clear, claims 37-59 are indefinite.

Claim 39 recites “determining an average transformed profile of all transformed experimental profiles and transformed reference profiles.” It is not clear whether two average profiles are determined separately for all TA_m or/and all TC_m ; one average profile is determined for all TA_m and TC_m , *etc.* As the intended limitation is not clear, claims 39-59 are indefinite.

Claim 40 recites the limitation “wherein said difference is determined using a subset ... in said transformed profiles. The antecedent basis of the limitation “said transformed profiles” is not clear because the claim recites $\{TA_m\}$, $\{TC_m\}$, and an **average** transformed profile. It is further not clear whether “determining” and “using” are intended to be active, positive steps of the method or merely an intended use of the method. As the intended limitation is not clear, claims 40-59 are indefinite.

Claim 41 recites the limitation “wherein said subset of measurements in the transformed profiles consists of measurements that are ranked similarly between an experiment or reference profiles and said average profile.” It is not clear whether the limitation “the profiles” is intended

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to comprise an average profile, only A_m or C_m , both A_m and C_m , *etc.* It is not clear what is ranked, *e.g.*, experimental measurements, reference measurements, average measurements, *etc.*, and between what ranked measurements the similarity is assessed. It is also unclear whether measurements are ranked, for example, in each profile, OR measurements are ranked between the value of measurements in a reference profile (*e.g.*, maximum measurement is 10) and the value of measurements in an average profile (*e.g.*, minimum measurement is 5) (*i.e.*, experimental measurements are ranked between 5 and 10). It is also unclear whether “reference” and “experiment” profiles recited in claim 41 are intended to be “transformed” profiles. As the intended limitation is not clear, claims 41-59 are indefinite.

Claim 42 recites the limitation “claim 41, wherein said comparing in step (a2) is carried out by a method comprising [steps] (a2i) binning measurements ... and (a2iv).” The limitation “said comparing” does not have an antecedent basis because claim 41 does not recite a step of “comparing.” It is further unclear whether each bin comprises only A or C measurements OR both A and C.

Claim 42 depends from claim 30. It is also unclear whether steps (a2i)-(a2iv) recited in claim 42 are intended to be active, positive steps of the method recited in claim 30 or merely an intended use of the method. If the former, then it is not clear where the steps fit within the steps recited in claim 30 and whether the steps (a2i)-(a2iv) are intended to be added to or substitute steps of claim 30.

As the intended limitation is not clear, claims 42-59 are indefinite.

Claims 43 and 45 recite “experimental profile A_m ” and “reference profile C_m .” Claims 43 and 45 depend from claim 30, which recites a processed experiment profile identified as A_m and a processed reference profile identified as C_m . Thus, it is not clear what “profiles” are intended in claims 43 and 45. As the intended limitation is not clear, claims 43-59 are indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-18, 25, 30-31, 58-59, and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Weng, WO 03/004677.

Weng discloses a method of error correction for a pair of profiles A v. C, wherein A is an experiment profile and comprises data sets $\{A(i)\}$ and C is a reference profile comprising data sets $\{C(i)\}$ (p. 19-28; claims 1-5). Weng discloses a measured background noise level of measurement of cellular constituent (i), *i.e.*, $Abkg(i)$, and calculating an average background profile for every A(i) (claims 19-21). Weng discloses calculating an average profile (claim 20 and p. 21) and determining a differential profile (claims 1-8 and 19-21; pages 19-28). Weng discloses generating an error-adjusted experimental profile using a differential reference profile (claims 1-5 and 19-21; pages 19-28). Thus, Weng anticipates claims 1-4 and 66. Weng discloses using a weighting factor for calculating an error-corrected experimental profile (p. 22, 27-28 and claims 7-8, 20-22), thereby anticipating claims 5-8. Weng discloses determining an error sigma

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(σ) of an error-adjusted profile (p. 21-28 and claims 1-8 and 19-22), thereby anticipating claims 9-14. Weng discloses using a two-channel microarray experiment (p. 13, lines 27-30; p. 18, lines 22-30), thereby anticipating claim 15. Weng discloses measuring a labeled sample (p. 13, lines 14-35), thereby anticipating claim 16. Weng discloses a virtual profile (p. 4, lines 12-20), thereby anticipating claim 17. Weng discloses "transformed profiles" (e.g., normalized, differential, and weighted profiles; p. 24, 27-28), thereby anticipating claim 18, 25, and 30-31. Weng discloses a system comprising a processor and a memory for performing his method and a computer readable medium (fig. 5 and claims 43 and 45), thereby anticipating claims 58-59.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Miller whose telephone number is (571)272-6101. The examiner can normally be reached on 8-6, M-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, Ph. D. can be reached on (571)272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Marina Miller
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Art Unit 1631

MM

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11/27/04